

CLAIMS

1. A semiconductor light emitting device comprising:

a substrate;

5 a semiconductor multilayer structure formed on a first main surface of the substrate, the semiconductor multilayer structure including a light emitting layer;

10 a first electrode and a second electrode formed on the semiconductor multilayer structure, power being supplied to the semiconductor multilayer structure through the first electrode and the second electrode so as to cause the light emitting layer to emit light;

a phosphor film covering at least a main surface of the semiconductor multilayer structure which faces away from the first main surface of the substrate;

15 a first terminal and a second terminal formed on a second main surface of the substrate;

a first conductive member electrically connecting the first electrode to the first terminal; and

20 a second conductive member electrically connecting the second electrode to the second terminal.

2. The semiconductor light emitting device of Claim 1, wherein

25 at least part of each of the first conductive member and the second conductive member is a plated-through hole provided in the substrate.

3. The semiconductor light emitting device of Claim 2, wherein

the semiconductor multilayer structure is divided into a plurality of portions by a division groove that is deep enough

to reach the substrate, and

each of the plurality of portions is constituted as an independent light emitting element.

5 4. The semiconductor light emitting device of Claim 3, wherein
the light emitting element has a diode structure, and
includes an anode electrode and a cathode electrode,
a plurality of light emitting elements are connected in
series in such a manner that a cathode electrode of a light
10 emitting element is connected to an anode electrode of a different
light emitting element using a wire formed by a thin metal film,
and

an anode electrode of a light emitting element at a higher
potential end of an array of the plurality of light emitting
15 elements is constituted as the first electrode, and a cathode
electrode of a light emitting element at a lower potential end
of the array is constituted as the second electrode.

5. The semiconductor light emitting device of Claim 1, wherein
20 at least part of each of the first conductive member and
the second conductive member is a conductive film formed on
a side surface of the substrate.

6. The semiconductor light emitting device of Claim 5, wherein
25 the semiconductor multilayer structure is divided into
a plurality of portions by a division groove that is deep enough
to reach the substrate, and

each of the plurality of portions is constituted as an independent light emitting element.

7. The semiconductor light emitting device of Claim 6, wherein
the light emitting element has a diode structure, and
includes an anode electrode and a cathode electrode,

5 a plurality of light emitting elements are connected in
series in such a manner that a cathode electrode of a light
emitting element is connected to an anode electrode of a different
light emitting element using a wire formed by a thin metal film,
and

10 an anode electrode of a light emitting element at a higher
potential end of an array of the plurality of light emitting
elements is constituted as the first electrode, and a cathode
electrode of a light emitting element at a lower potential end
of the array is constituted as the second electrode.

15 8. A lighting module comprising:

a mounting substrate; and

a semiconductor light emitting device defined in one of
Claims 1 to 5, wherein

20 the semiconductor light emitting device is mounted on the
mounting substrate in such a manner that a first terminal and
a second terminal are faced to the mounting substrate.

9. The lighting module of Claim 8 further comprising:

25 a reflective mirror surrounding a semiconductor
multilayer structure of the semiconductor light emitting device
so as to reflect light emitted from a side surface of the
semiconductor multilayer structure in a direction substantially
perpendicular to a first main surface of a substrate.

10. The lighting module of Claim 9, wherein

the mounting substrate has a depression which increases
in diameter from a bottom to an open end,

5 the reflective mirror is a reflective film provided on
a wall of the depression, and

the semiconductor light emitting device is mounted on the
bottom of the depression.

10 11. A lighting apparatus including a lighting module defined
in Claim 8 as a light source.

12. A display element including a semiconductor light emitting
device defined in one of Claims 1 to 5 as a light source.

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13. A manufacturing method for a semiconductor light emitting
device, comprising steps of:

forming a semiconductor multilayer structure including
a light emitting layer on one of main surfaces of a substrate;

20 dividing the semiconductor multilayer structure into a
plurality of portions each of which corresponds to the
semiconductor light emitting device;

forming a phosphor film on and around each of the plurality
of portions of the semiconductor multilayer structure; and

25 dividing the substrate for each of the plurality of
portions.